



## EPA Region 7 TMDL Review

TMDL ID 330 Water Body ID WQLS: 9, 10

Water Body Name South Fork Cottonwood River Watershed

Pollutant Biology: Fecal Coliform Bacteria

Tributary Sharpes Cr. 38, Rock Cr. 37, Kirk Cr. 48, Crocker Cr. 46, Corn Cr. 47, Little Cedar Cr. 45, Mercer Cr. 716, Little Cedar Cr. 11, Cannonball Cr. 745

State KS HUC 11070203

Basin Neosho

Submittal Date 11/19/2004

Approved approved

### Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/ water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

Letter formally submitting this TMDL for approval under Section 303(d) was received November 19, 2004.

### Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

The water quality standard is narrative: "Surface water shall be free, at all times, from the harmful effects of substances that originate from artificial sources of pollution and that produce any public hazard, nuisance condition or impairment of a designated use." The impaired use is Special Aquatic Life Support on the main stem segments. This TMDL links the narrative standard with the macroinvertebrate biological index (MBI), the ephemeroptera, plecoptera, trichoptera (EPT) index, and Kansas Biotic Index (KBI) scores, as well as percent mussel loss. MBIs and EPTs calculated from biological samples were used to determine impairment, as well as percent mussel loss. The goal of this TMDL is to maintain the MBI scores below 4.5 and keep fecal coliform bacteria levels

below the water quality standard using 200 counts/100mL. The targeted endpoint identifies a 95% reduction in fecal coliform bacteria, an 8% reduction in the MBI, a 33% increase in the EPT, and a 57% increase in the mussel loss; meeting these goals should result in a fully supporting aquatic life use.

#### **Numeric Target(s)**

*Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.*

All beneficial uses are described. The water quality standard is narrative, and the numeric biological indice targets are indirectly related to a numeric translation of the narrative standard. The load reduction for bacteria was determined using site specific chemistry and biological data collected in the watershed; the endpoint is no more than one sampling with a MBI score of greater than 4.5 over 2007-2011.

#### **Link Between Numeric Target(s) and Pollutant(s) of concern**

*An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.*

The main sources of pollution in the watershed are animal waste, effluent from a waste treatment plant, and fertilizer applications; given these sources, the following parameters were suspected pollutants causing impairment: ammonia, nitrate, total phosphorus, biochemical oxygen demand, fecal coliform bacteria, and total suspended solids. Three sets of analysis were completed to determine if there was a direct link between elevated levels of the probable pollutants, given the sources, and the biological metrics. Statistical analyses identified a significant correlation between the MBI values and fecal coliform bacteria concentrations; no other statistically significant correlation was found between other probable pollutants and the biological metrics.

#### **Source Analysis**

*Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.*

There is one NPDES permitted waste treatment facility in the watershed; the facility does not regularly discharge and monitors for fecal coliform bacteria in the effluent, but it is rarely detected. Animal waste from grazing areas is the primary contributing factor; ninety-one percent of the land use is grassland. The winter grazing density is high, and the summer grazing density is medium. There are four livestock waste management systems in the watershed; two are NPDES permitted. Potential animal units for all facilities in the watershed total 3,393. Forty-six percent of the households in Chase County have septic systems. All significant sources have been considered.

**Allocation**

*Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.*

This is a phased TMDL, and, the link between the attainment metric and the allocated pollutant is direct. Concentration WQS-based targets based on 200 counts/100 mL fecal coliform bacteria and flow duration analysis were used to express the TMDL as a load duration curve.

**WLA Comment**

The WLA is demarcated by the area under the load duration curve bounded from 99% to 100%, corresponding to a 7Q10 low flow. All non-discharging facilities have a WLA of zero.

**LA Comment**

The load allocation is demarcated by the area under the load duration curve bounded from 1% to 99% of the time under the load duration curve; this corresponds to a 95% reduction in fecal coliform bacteria.

**Margin of Safety**

*Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.*

The endpoint is an adequate MBI value. The margin of safety is explicit and provides additional biological measures using the EPT (ephemeroptera, plecoptera, trichoptera index) making up at least 48% of the sample population, including ammonia intolerant species, when MBI values are 4.5 or lower. This will ensure that the majority of aquatic macroinvertebrate population is composed of pollution intolerant taxa.

**Seasonal Variation and Critical Conditions**

*Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).*

Seasonal variation is accounted for in this TMDL by the TMDL curves which represent all flow conditions.

**Public Participation**

*Submittal describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).*

Public meetings to discuss TMDLs in the Neosho Basin were held on January 9, 2002 in Burlington and March 4, 2002, in Council Grove. Public hearings were held in Burlington and Parsons on June 3, 2002. The Neosho Basin Advisory Committee met to discuss TMDLs in the basin on October 2, 2001, January 9, March 4, and June 3, 2002. Meetings

to discuss the TMDLs with interest groups include the Kansas Farm Bureau. An active internet web site is established at <http://www.kdhe.state.ks.us/tmdl> for the public to review draft and final TMDLs.

#### **Monitoring Plan for TMDL(s) Under Phased Approach**

*The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).*

KDHE will continue to collect and evaluate seasonal biological samples for three years over 2002-2007 and an additional three years over 2007-2011 to evaluate continued ammonia levels below the detection limit of 0.10 mg/L and achievement of the desired biological endpoint. Mussel loss data must be collected at station 719 to verify if a true impairment exists on Palmer Creek.

#### **Reasonable assurance**

*Reasonable assurance only applies when reduction in nonpoint source loading is required to meet the prescribed waste load allocations.*

Reasonable assurances, although not required for this TMDL, include authorities such as state statutes, regulations, and funding from the State Water Plan Fund.

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